



A Guide to

Planting Waterwise





This booklet is designed to help Lincoln conserve its supply of drinking water by informing residents on reducing outdoor water use. During times of drought, it is essential to stay informed on water issues. In addition, adopting on-going landscape watering conservation practices is just plain "water smart." We hope you will join the effort to ensure a supply of safe, drinkable water for all.

TREES, SHRUBS, AND PERENNIAL FLOWERS

1. Planning a Water-wise Landscape

a. Working With Our Soil Type:

- Most of our local soils are high in clay content. Unfortunately, this reduces the water infiltration rate and increases waste water runoff. Water slowly, deeply and less frequently. Frequent and light watering results in shallow root systems, making plants less drought-tolerant.
- Incorporate organic matter into your soil to increase water absorption, ease root growth and achieve healthy levels of soil moisture retention. Check with your local landscape professional for recommended organic materials and incorporation rates.

b. Planting With Purpose:

- Choose plants that are appropriate for the specific location in which they are to be placed, (wet, dry, sunny, shady). Follow USDA planting zone recommendations.
- Use landscape plants with greater drought tolerance and disease resistance.
- Mulch large areas around landscape plantings to keep turfgrass away from feeder roots.

2. Watering Landscape Plants

a. To Water or Not to Water?

- To check, pull mulch back from around the center of a plant and pick up a small amount of the soil. Squeeze the soil in your hand, and attempt to make a ball. If the soil is sticky and muddy, the plant has excess moisture. If the soil stays in a ball but is not sticky, the moisture is sufficient. If the soil does not stay together, the soil is dry, and moisture should be applied. If your soil has not been modified with organic amendments and is high in clay content, the soil ball may not break apart when dry.
- Most plants in our clay soils fail due to over-watering. Landscape plants need about one inch of moisture per week.
- Check plants on a consistent basis. Test at least every seven to ten days if we are experiencing drought conditions. Smaller

- ◆ shrubs and perennial flowers with smaller root balls often dry out faster than the surrounding soil and these may require more frequent checks.

b. Recognizing Drought Stress

- ◆ Drought can impose visible stress on plants quickly, or the damage may take years to appear.
- ◆ Deciduous leaves may develop brown edges or browning between the veins. They may also grow smaller than their normal size. Premature leaf drop is common.
- ◆ Evergreen leaves and needles may turn colors such as yellow, red, purple and brown.

c. New vs. Established Plantings

- ◆ Most established plantings have well developed root systems, which allow them to find and utilize moisture more efficiently than newer ones.
- ◆ New plantings possess a limited root system and require more monitoring during the first few years. They are easily drowned by too much moisture and show drought stress quickly.

d. Winter Watering

- ◆ Winter watering during drought conditions can be an advantage for many plants, especially those with evergreen foliage. Water them when temperatures reach 40 degrees and above.

3. Watering Methods and Tips

Whatever method you choose, keep in mind the following:

- ◆ Apply moisture slowly and deeply. Remember, our heavy clay soils will only accept so much water at a time.
- ◆ All watering recommendations should be adjusted in relation to the current weather conditions. If you have an automatic irrigation system, DO NOT let the automatic timer be your only guide. For example, reduce water applications to compensate for sufficient rainfall already received.

- ◆ Water primarily near the center of a plant.
- ◆ Avoid using watering methods that spray water up into the air. Much of the water is lost to evaporation. Low trajectory watering pattern sprinklers, open hose ends, or drip systems are the most efficient.
- ◆ Periodically inspect your watering system for needed repairs. Fix leaks and poorly adjusted sprinkler heads. Avoid wasting water on concrete surfaces and streets.
- ◆ Avoid moisture on landscape plant foliage. This promotes disease and stress. Watering early in the morning will allow foliage moisture to dry off before the heat of day and reduce evaporation loss. If you must water later in the day, do so early in the evening so foliage can dry off before the coolness of evening when fungus and other disease problems can occur.
- ◆ Examine the water needs of various areas on your property, and water accordingly. For example, water those areas that are drier more often, and those known to be regularly moist, less often.

4. Drought Management

Unlike some turfgrasses, our trees, shrubs, and perennial flowers cannot be “weaned” into a dormant state during the growing season. Stress and tissue damage can incur. Here are some practices that will help in drought or any conditions.

a. Balanced Watering Plan

- ◆ Fluctuation from excessive to little or no soil moisture causes plant stress. Checking your plants on a consistent basis and applying the appropriate amount of water is best.

b. Mulch

- ◆ Use some type of organic mulch in your planting beds and around newly planted trees. Mulches reduce moisture evaporation, keep the soil surface cooler, protected, and assist in the control of unwanted weeds.
- ◆ Apply mulches in a 3- to 4-inch depth.
- ◆ Wood mulches are commonly used and can improve our clay soil over time as

- ◆ they decompose. Do not place wood mulch directly against the plant trunk.
- c. Keep Plantings Healthy and Weed Free**
- ◆ A vigorous, healthy plant is more likely to endure periods of stress such as drought and be less susceptible to disease.
- ◆ Weeds compete for moisture, nutrients, root space and light, so it is important to keep weed growth under control.
- ◆ Fertilize plants at proper times, primarily spring and late fall. Do not fertilize plants under drought stress. This may burn root systems or stimulate new top growth, which the plant cannot maintain during times of limited moisture.

TURFGRASSES

1. Cool-Season Grasses

a. Soils:

- ◆ Much depends on the type of soil below your lawn and landscape plantings, and it's usually the most overlooked factor in lawns and lawn maintenance. For optimum plant growth, soils should be a balanced clay-loam-silt type. However, most people don't have a choice on lawn soils, and once it's there, you're usually stuck with it. Most soils in Lincoln are a heavy clay or clay-loam. They are not ideal for growing grass or other plants because they tend to compact easily and water infiltration is slow. But understanding how soils work can greatly affect your ability to work with them for the health of your landscape.

b. Lawn grass species:

- ◆ In most Lincoln landscapes, the largest amount of water used during the summer is on the lawn. The majority of lawns are cool-season grasses: Kentucky bluegrass, turf-type tall fescue or blends of these with other grasses like perennial ryegrass.
- ◆ Kentucky bluegrass is a resilient, sod-forming grass that tolerates heavy use, but requires more water than most others to remain green during the hot summer months. A general rule is to water Kentucky bluegrass lawns one to one-and-one-half inches per week during the growing season. However, to conserve

- ◆ water during periods of drought and watering restrictions, Kentucky bluegrass can be allowed to go dormant. Supplemental irrigation is needed only if sustained drought occurs (*more than 3 weeks without rain*) to keep the plant crowns alive. Kentucky bluegrass lawns will green up with late summer and fall rains.
- ◆ Turf-type tall fescue is a bunch-type wear-tolerant grass that has the advantage of drought-tolerance as well as drought-resistance. It usually requires little supplemental irrigation during the growing season. Once established, its deep root system can make use of water available at lower soil depths than Kentucky bluegrass. However, unlike Kentucky bluegrass, once the subsoil moisture is depleted, tall fescue cannot go dormant, and plants may die. During extended drought, some supplemental irrigation may be required to keep the plant crowns alive. Because it is not a sod-forming grass, dead spots in the lawn will require over-seeding to fill back in.

c. Cultural Practices:

This publication will not go into lawn pest control or fertilization except to warn against applying excessive nitrogen any time and fertilizing during the summer. For complete guidelines on grass species' disease, insect and weed control and fertility requirements, contact the Lancaster County Extension Educator.

- ◆ To promote rooting and stress tolerance, maintain high mowing heights throughout the season. Longer grass shades the soil, keeping it cooler and causing less stress during periods of drought. Also, mow less frequently during periods of drought, and minimize traffic on the grass if possible.
- ◆ Higher mowing heights promote deeper rooting. Deeper roots are more resistant to drought. Do not remove more than one-third of the top growth at one time to prevent injury to the grass.
- ◆ Heavy soil and high-traffic lawns should be aerated in spring and fall to control thatch, to relieve soil compaction for

- ◆ better water, oxygen and nutrient infiltration and to promote root growth.

d. Watering:

Most lawns in Lincoln are watered too frequently. Lawns, no matter the species or soil type, should not be watered daily or lightly, which encourages shallow rooting. The general rule is to water only as needed to prevent wilting. This requires property owners to be vigilant, plan ahead and allow for changes in weather conditions. Do not turn the automatic irrigation system on in the spring and then forget about it, especially during rainy periods. Become knowledgeable and active in your landscape in order to use water only as needed.

- ◆ Irrigating lawns every three days is usually sufficient, and many lawns can be watered once a week without damage. Others will tolerate even longer periods without supplemental irrigation. Always water during the cool part of the day!
- ◆ Know the grass species in your lawn and the soil type. Measure the amount of water applied and the depth of infiltration into the soil. Do not water deeper than the root depth, and stop watering if it runs off the lawn. Very heavy clay soils may require you to water, wait, and then water again.
- ◆ Many property-owners spend the most time and money maintaining a green lawn. But lawns can be replaced easier than trees, shrubs and perennial beds and should be considered a lower-priority for irrigation.

2. Warm-Season Grasses

In this booklet, we are advocating the use of buffalograss for new lawns. For zoysiagrass or other warm-season grass species, contact the Lancaster County Extension Educator.

Buffalograss Plugs

Planting and Establishment

a. Planting

Soil preparation:

Apply Roundup to kill weeds according to label directions.

SEASONAL CARE OF ESTABLISHED TURFGRASS FOR DROUGHT OR LOW WATER CONDITIONS

TURF TYPE SPRING March to June

	Mowing Ht. (inches)	Water/week* (inches)
Kentucky Bluegrass	2 - 3"	1"
Turf-type Tall Fescue	3 - 3.5"	water to prevent wilt; 1"
Fine Blade Fescue	2.5 - 3"	1"; do not over water in shade
Buffalograss	none or 2 - 4" once per month	none necessary; once/month in dry spring

TURF TYPE SUMMER June to September

	Mowing Ht. (inches)	Water/week* (inches)
Kentucky Bluegrass	3 - 3.5"	1.5"***
Turf-type Tall Fescue	3 - 4"	water to prevent wilt; 1"
Fine Blade Fescue	2 - 3" longer in heavy shade	1"; do not over water in shade
Buffalograss	none or 2 - 4" once per month	none necessary; once/month July - Sept. for color

TURF TYPE FALL October to November

	Mowing Ht. (inches)	Water/week* (inches)
Kentucky Bluegrass	2.5 - 3"	1"
Turf-type Tall Fescue	3 - 3.5"	water to prevent wilt; 1"
Fine Blade Fescue	2.5 - 3"	1"; do not over water in shade
Buffalograss	none	none

*Includes rainfall

** May allow to go dormant; irrigate only if more than 3 weeks without rain

NOTE: Seasonal mowing height recommendations are listed for persons who desire a lower mowing height during spring and fall. Rooting, as well as overall lawn health, is promoted by maintaining the summer mowing heights for the entire growing season.

Spacing and Planting:

- ◆ Space plugs 12 to 18 inches apart.
- ◆ Dig a hole for the plug no deeper than the plug.
- ◆ Plant plugs and lightly roll with lawn roller.
- ◆ Make sure the plug sides are in direct contact with surrounding soil.

Fertilization:

- ◆ Fertilize with sod/seed starter according to label directions.

Watering:

- ◆ Soak thoroughly after planting, and keep area moist for the first two weeks without “run-off.”
- ◆ Slowly reduce watering. After the fourth week, soak area once or twice per week until plugs have covered the area.

Weed control:

- ◆ Apply a pre-emergent herbicide as recommended by your local nursery.

Mowing:

- ◆ Mow at a height of two to three inches as frequently as necessary to control weed growth.

b. Care After Establishment

Fertilization and weed control:

- ◆ Fertilize in spring and late summer with a fertilizer containing slow release and pre-emergent herbicide. Contact your local garden center or nursery for specific application rates and requirements.

Watering:

- ◆ Water only in times of extreme drought to keep green. If you choose not to water, the grass will not be harmed.

Mowing:

- ◆ In early spring, mow to a height of two inches, and remove dormant thatch. Mow at a high setting as needed.

Buffalograss Turf Seed Planting and Establishment

a. Planting

Soil preparation:

- ◆ Apply Roundup to kill weeds according to label directions.
- ◆ Roto-till four to six inches deep after five days.

Seeding:

- Seed in late spring or early summer.
- Apply three to four pounds of seed per 1,000 square feet.
- Broadcast or drill seed one-fourth inch deep, and rake soil lightly if broadcast.
- Pack the area with a roller to maintain soil contact with seed.

Watering:

- Soil should be kept *moist*, not wet.
- Irrigate every other day, and continue this 14 days following germination.
- Reduce watering to twice per week, and gradually reduce watering as sod develops.

Mowing and Weed Control:

- Mow just above the height of the buffalo grass, and do not apply herbicides.

(Care after establishment is the same as the plugged Buffalograss)

NOTE: For more details on how to manage your turf variety, contact your local nursery.

Sources:

*Kentucky Bluegrass Lawn Calendar, NebGuide #G80-517,

*Tall Fescue Lawn Calendar, NebGuide #G80-559-A,

*Conserving Water in the Landscape, NebGuide #G91-1061-A,

*Landscape Sustainability, NebGuide #G001405-A,

*Water-Efficient Landscaping, U.S. Environmental Protection Agency, Office of Water, EPA832-F-02-002,

* A University of Nebraska Cooperative Extension Publication

www.epa.gov/own/water-efficiency/index.ht

IRRIGATION MANAGEMENT PRACTICES

As the demand for available water resources increases in the future, proper and efficient water management practices will become even more crucial for all of us. At the same time, the environmental, recreational, aesthetic, and economic benefits of beautiful well-managed landscape, turf and garden areas will grow in importance.

- Ideally, we should be using drip irrigation (*low volume*) for all ornamental and landscape plant material; pressure-regulated spray heads; and automatic rain sensing devices that shut down irrigation systems during a rain event.

Along with these mechanical devices, it is important to have a properly designed irrigation system from a reputable contractor. In all states, contractors may also have a Certified Irrigation Designer (CID) or Certified Irrigation Contractor (CIC) designation through the Irrigation Association of America.

1. The Spring Start-Up:

An underground irrigation system is like any other mechanical device and should have a tune-up every spring. A proper maintenance program will insure that your system will operate for years without any major problems.

- ◆ A proper spring tune-up will include an inspection of each individual zone and controller setting. The trained service technician will also check the nozzle and arc adjustment as well as any leaks and or weeping valves.
- ◆ A spring tune-up is also a good opportunity to check backflow prevention devices that protect our drinking water supply. These devices can only be tested by a grade 6 water operator; ask your service company if they qualify.

2. Irrigation Audit:

Another beneficial service your qualified irrigation contractor can provide for you is an irrigation audit. This procedure can also be performed by the homeowner. The goal is to eliminate waste and run-off by determining the precipitation rate of each individual zone for a specific run time to ensure the correct amount of water is being applied.

- ◆ By determining the precipitation rate (PR) of each individual zone, you can calculate the inches per hour. In our area of the state, the soil is clay or clay loam and will absorb about .32 inches of water per hour. Any more fills the pores in the clay and becomes run-off.
- ◆ Setting up an audit field differs for each type of sprinkler being tested as well as how they are spaced. The three major types of sprinkler heads are spray heads, rotary/impact and stream sprays (finger spray) and the three major spacings are single row, triangular and square.
- ◆ Various parts of your landscape require different patterns.

3. Measuring Application Amount:

Supplies needed to set up an audit field are catch cans (a minimum of 16) or ground staked rain gauges and flags to mark the individual heads.

- ◆ Run the zone for 15 minutes. Then, using a larger rain gauge, pour the water from all catch devices into that measuring device and divide by the number of catch devices used. This will give an average of precipitation for that zone. Then multiply by four to determine how many inches per hour that zone is delivering.

NOTE: To measure your specific irrigation installation patterns, work directly with your irrigation contractor.

Run-Off Prevention:

After each zone has been calculated, determine the run times for each zone where the precipitation rate does not exceed .32 inch per hour. It is better to apply the water in two .16- to .17-inch applications so the first application has time to absorb into the top layer of soil and pass into the root zone, which encourages deep root growth.

- ◆ For hand watering, you may want to take your measurements in 30-minute increments, and place your catch cans in a 10-foot by 10-foot grid. After you have established your run times, it is a good idea to use battery-operated timers on the faucet or a baking timer to prevent over-watering.
- ◆ Once the audit is complete, locate your irrigation controller, and program each individual zone with the information from the audit. When setting up your controller, take into account the turf type to be watered.

5. Controller Programming Tips:

- ◆ Water turf during the cool part of the day.
- ◆ Never water during the heat of the day.
- ◆ Water plants and vegetable gardens after the heat of the day to replenish transpiration losses.
- ◆ Be sure to use the A/B program on the controller to separate start time for turf and landscapes.

6. Upgrading Irrigation Systems

- ◆ Newly planted and landscape beds should be irrigated with drip irrigation (low volume). A professionally designed drip zone will be tailored to give each plant, shrub and ornamental the exact amount of water needed. It also prevents the over-watering of some plants and the under-watering of others and uses far less water to perform the same duty as an aerial system. Drip systems should be run about twice a week in the spring and the fall and three times a week in the summer. Drip systems emit water on an hourly basis and if designed correctly, the entire zone should be able to run for one hour.
- ◆ Pressure regulated spray heads are designed for high pressure areas with a static water pressure of 60 to 100 psi, reducing evaporation losses and wind drift and ensuring that a larger water droplet reaches the ground. Pressure regulated spray heads can save between 50,000 and 120,000 gallons of water per year, per residence and even more at commercial sites.
- ◆ The automatic rain sensor is adjustable for one-eighth inch to 1 inch of rainfall. A recommended setting for our area is .25 to .5 inches.



*Special Thanks to:
the Mayor's Water Conservation Task Force and
University of Nebraska-Lincoln Department of
Agronomy and Horticulture*

*photo courtesy of the University of
Nebraska-Lincoln Botanical Garden and Arboretum*